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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,666	03/27/2001	H. Jim Fulford	2000.045900/TDM	2445

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EXAMINER
TRAN, BINH X

ART UNIT	PAPER NUMBER
1765	4

DATE MAILED: 11/21/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/818,666	Applicant(s) FULFORD ET AL.	
	Examiner Binh X Tran	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) *33-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-35* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-32, drawn to process, classified in class 216, subclass 59.

II. Claims 33-35, drawn to apparatus, classified in class 156, subclass 345.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process as claimed can be practiced by another materially different apparatus such as using a system without a controller.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Terry Morgan on 9-11-2002 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-32. Affirmation of this election must be made by applicant in replying to this Office action. Claims 33-35 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1, 2, 8, 13, 18, 23, 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1, 13, "varying the temperature of a subsequently processed semiconducting substrate in a region corresponding to the first preselected region in response to the first depth being different from the desired depth" is subjective, vague and indefinite.

In claim 2, 13 "varying the temperature of a subsequently processed semiconducting substrate in a region corresponding to the second preselected region in response to the second depth being different from the desired depth" is subjective, vague and indefinite.

In claim 23 "varying the temperature of a subsequently processed semiconducting substrate in a region corresponding to the second preselected region in

response to the second depth being different from the second depth" is subjective, vague and indefinite.

In claims 8, 18, 28 "varying the temperature of the subsequently processed semiconducting substrate in the region corresponding to the first preselected region as a function of the difference" is vague and indefinite. It is unclear what is "the difference" applicants wish to refer.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bukhman et al. (US 5,795,493) in view of Bollinger (US 5,375,064)

Bukhman teaches a method comprising:

forming a process layer above a semiconductor substrate;

etching at least a portion of the process layer (col. 6 lines 40-67, col. 8 lines 34-38);

measuring a thickness of the device wafer at a plurality of location (col. 8 lines 38-40, read on "measuring a first depth of the etch in a first preselected region of the semiconducting substrate");

heating the plurality of portions to a temperature determined by heating profile map and repeating the etching, heating step until the wafer has a predetermined

thickness (Note: the term "predetermined thickness" is the same with "desired depth" col. 8 lines 40-50, read on "varying the temperature of a subsequently processed semiconducting substrate in a region corresponding to the first preselected region in response to the first depth being different from the desired depth").

Bukhman does not explicitly disclose the step of comparing the first depth to the desired depth. In a semiconductor method, Bollinger disclose the comparison step (34) to compare the measured thickness profile (i.e. first depth) with a predetermined or desired thickness (i.e. desired depth) (col. 4 lines 45-60, Fig 3). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Bukhman in view of Bollinger by comparing the first depth to a desired depth because it help us to determine whether we should stop or continue with the etching process.

Respect to claims 2, Bukhman discloses measuring a thickness of the device wafer at a plurality of location (col. 8 lines 38-40, read on "second location"). The steps of comparing the depth to a desired depth as well as varying the temperature of the subsequently process have been discussed in previous paragraphs.

Respect to claim 3, Bukhman clearly teaches measuring the thickness of the wafer at a plurality of portion (including the second depth) and etching the wafer to the predetermined thickness. Since "predetermined thickness" (i.e., desired thickness) can be any thickness value, it would have been obvious to one having ordinary skill in the art, at the time of invention, to pick the second depth as the desired thickness. The limitation of claims 13 and 23 have been discussed in previous paragraphs.

Respect to claims 4-5, 14-15 and 24-25 Bukhman teaches an increase in temperature results in proportional increases in etch rate (col. 4 lines 48-55). The examiner will interpret that Bukhman also implicitly teaches that a decrease in temperature results in proportional decreases in etch rate. Therefore it would be obvious to one skill in the art to increase (or raise) the temperature of the subsequently process if the second depth is less than the desire depth. It is also equally obvious to one skill in the art to decrease the temperature of the subsequently process if the second depth is greater than the desire depth since temperature is a result effective variable.

Respect to claims 6, 16 and 26, Bukhman teaches that the process layer is a polysilicon above the semiconductor substrate (col. 2 lines 42-50). Respect to claim 7, 17 and 27 Bukhman teaches performing a plasma etching process on the layer (col. 3 lines 24-52). Respect to claims 8, 18 and 28 the step of varying the temperature of the subsequently process has been discussed in previous paragraphs.

Respect to claim 9-12, 19-22, 29-32, Bukhman teaches to measure the depth of a plurality of locations (col. 8 lines 26-50). It is known both in math and statistics that the average, the median, the minimum, the maximum must exist and can be calculated if a plurality of data point is known (i.e., the plurality of measured depths is known. It would have been obvious to one having ordinary skill in the art, at the time of invention, to use the average, the medium, the minimum or the maximum as the first depth because it can be easily calculated.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X Tran whose telephone number is (703) 308-1867. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin L Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Binh X. Tran
November 15, 2002

BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
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